When there are no proposed changes in the taxonomic relationships of species, elevating precedence over usage in the choice of a name serves no purpose and merely causes confusion; this is especially acute if a name (in this instance *Cuniculus*) switches meaning.

(2) Peter Lüps

Naturhistorisches Museum, Bernastrasse 15, CH-3005 Bern, Switzerland

The spare time that I can devote to research on the Eurasian badger, *Meles meles*, is concentated on morphology and ecology. I have little or no experience in taxonomy. I do not see any reason to change the authorship of the generic name for this taxon and I therefore support the proposal to keep *Meles* Brisson, 1762.

Comments on the proposed conservation of usage of 15 mammal specific names based on wild species which are antedated by or contemporary with those based on domestic animals

(Case 3010; see BZN **53**: 28–37, 125)

(1) D.W. Yalden

School of Biological Sciences, The University of Manchester,
3.239 Stopford Building, Oxford Road, Manchester M13 9PT, U.K.

I write as the Managing Editor of *Mammal Review*. I must congratulate Anthea Gentry, Juliet Clutton-Brock and Colin Groves on a remarkably sensible and well argued case. The specific names discussed were, in most cases, intended to contrast the domestic animal with the wild one, or were coined to distinguish the wild animal from its previously known domestic relative. To attempt now to claim that the specific name of the domestic form is the correct name for its wild relative also is totally confusing, totally destabilising, and totally unhelpful. The contrast between *Canis lupus* and *C. familiaris* is well understood in popular as well as scientific writing, and in archaeological as well as zoological literature. The same contrast is equally clear when *Ovis orientalis* and *O. aries* are used. Using *aries* to include *orientalis* is undermining the well accepted nomenclature of the wild species, and I thoroughly deplore it.

I am enough of an archaeologist to understand the very real problem raised by the nomenclature of domestic animals, and can appreciate the difficulties that various attempts to derive a generally acceptable terminology have created. These difficulties in no way justify upsetting the one established and stable part of this problem (the names for the wild taxa), and certainly not doing so in a manner that will cause the maximum confusion.

I wish to support the very sensible proposal unreservedly in an attempt to maintain stability and clarity.

I trust that these authors or other interested parties will produce an attempt to stabilise the nomenclature of domestic animals in a similarly sane way, in the future and in a separate application, once this one has been settled.

(2) Gordon B. Corbet
Little Dumbarnie, Upper Largo, Leven, Fife KY8 6JQ, Scotland, U.K.

I strongly support this application. Previous attempts to remove ambiguity in the use of names for domestic forms and their wild ancestors by the adoption of general rules, as documented in this case, have failed both to effect modification of the Code and to prevent the continuing use of inconsistent practices and ambiguous names in influential works such as that of Wilson & Reeder (1993). Implementation of this proposal will stabilize the names of the wild species, while allowing freedom of taxonomic judgement as to what degree of domestication can be encompassed in the species-concept employed. This is particularly important in many archaeozoological studies where the ancestral wild species is usually not in doubt while the evidence of domestication is debatable.

(3) László Bartosiewicz
Institute of Archaeological Sciences, Loránd Eötvös University, Múzeum körút 4/b, H-1088 Budapest, Hungary

As a zoologist working in both archaeozoology and the research of modern domestic animals I am in favor of retaining the 15 mammal specific names, as proposed by Gentry et al.

Their proposal is based on a convention widely followed in my areas of research. While its more consistent use would be a welcome improvement, I fear that the implementation of radical changes (such as in the 1993 Wilson & Reeder volume) would result in considerable confusion during a prolonged period of transition.

All nomenclatures are prone to change with the development of research. However, clarity and the consistent use of terms is most important. Therefore I support the idea of using traditional nomenclature for wild mammal species and their domestic derivatives which traditionally have separate names.

(4) S.M. Stallibrass
Department of Archaeology, University of Durham, South Road,
Durham DH1 3LE, U.K.

I have been researching animal bones from archaeological sites for 20 years and agree wholeheartedly with the authors of this application that it is essential that identification makes it clear whether the item concerned derives from a wild or a domestic or an intermediate form. The current variability in nomenclatural systems used and abused by different researchers sometimes makes identifications unclear and this, in turn, renders comparisons and interpretations unfeasible.

I welcome, therefore, the authors's efforts to clarify the situation and feel that the system that they propose, whereby the earliest name for the wild form is adopted even if it post-dates that for a domestic form, is eminently sensible.

Since I do not work with some of the taxa that they consider, I do not feel qualified to comment on the names that they recommend for these, but I do support the names that they suggest for *Equus africanus* (wild ass), *E. ferus* (tarpan), *Bos primigenius* (aurochs), *Capra aegagrus* (bezoar), *Ovis orientalis* (Asian mouflon), *Canis lupus* (wolf), *Mustela putorius* (polecat) and *Felis silvestris* (wildcat).

(5) Achilles Gautier
Laboratorium voor Paleontologie, Geologisch Instituut, Universiteit Gent, Krijgslaan 281, B-9000 Gent, Belgium

Approval of the usage of the 15 specific names for wild mammals which are antedated by or contemporary with those based on their domestic relatives may be considered a first step in labelling domestic animals; therefore I am very much in favour of the proposal put forward in Case 3010.

However, I do think that the same treatment should be applied to non-mammalian wild species (*Carassius gibelio* (Bloch, 1782), the Prussian carp, and *Bombyx mandarina* (Moore, 1872), the mulberry silk moth) the domestic forms of which were named before their ancestors. This I consider a more consistent and still less confusing approach; moreover, it may avoid another application in the future.

(6) Andrew Kitchener
Department of Geology and Zoology, Royal Museum of Scotland, Chambers Street, Edinburgh EH1 1JF, Scotland, U.K.

I strongly support Gentry et al. in their proposed conservation of the usage of 15 mammal specific names based on wild species. This is not only for practical reasons, but also because domestication as a process should be equated with allopatric speciation.

1. For all but a very few mammalian species (the polar bear, *Ursus maritimus*, for example; see Kurtén, 1964; Taberlet & Bouvet, 1992) when they speciated and which species was ancestral is unknown, even though it may be possible to infer common ancestors from cladistic analyses of morphological and molecular data. Domesticated mammals differ because in most cases an ancestor and the time of earliest domestication can be identified, but because this is mediated by humans and has occurred within the last 12000 years, domestication is regarded as being somehow outside other evolutionary change.

2. Domestication can be regarded as having effects similar to allopatric speciation (see Mayr & Ashlock, 1991). In its strictest definition (see, for example, Clutton-Brock, 1981) domestication results in distinctive morphological, molecular and behavioural changes, which are the result of either selection by humans for particular traits or genetic drift in small isolated founder populations derived from an ancestral wild population. Reproductive isolation is brought about by physical barriers created by humans (fences and cages, for example), whereas allopatric speciation is usually due to some form of geographical barrier. Archaeozoologists are able to distinguish between wild and domesticated species in the archaeological record (see, for example, Davis, 1987). It is, therefore, illogical to give both forms the same scientific name and, under the Code, incorrect to cite the domesticated as a subspecies of the wild form (as in '*Felis silvestris catus*'; see, for example, Kratochvil, 1973; Kerby & Macdonald, 1988).

3. In many cases closely related mammal and bird species do not conform to a strict interpretation of the biological species concept (see, for example, Mayr & Ashlock, 1992) because they are fully interfertile. Hybridisation between closely

related species of many mammals and birds is common (for example, marmosets, *Callithrix* spp., guenons, *Cercopithecus* spp., canids, cervids, caprines, ducks and birds of paradise; see Lernould, 1988; Struhsaker, Butynski & Lwanga, 1988; Coimbra-Filho, Pissinatti & Rylands, 1993; Lever, 1994; Fuller, 1995) in areas of sympatry in the wild, or in captivity, or through inroduction of one species into the range of another. For example, the introduction of sika deer, *Cervus nippon*, to Britain has resulted in extensive introgression with the native red deer, *Cervus elaphus* (see, for example, Lowe & Gardiner, 1975), but these two taxa are still regarded as distinct (although some authors claim that mainland forms of sika are introgressive hybrids). Therefore, interfertility between wild and domesticated species should not be regarded as negating their separate specific status. Application of other species concepts, including that of phylogenetic species, would support raising domesticated taxa to full specific rank (see, for example, Cracraft, 1989).

4. Feralisation and subsequent introgression with the wild ancestral species also does not negate the basic speciation process produced by domestication. For example, feral domestic ferrets, *Mustela furo*, from Shetland retain pelage characters, significantly smaller cranial volumes and other skull characters associated with domestication, despite being feral for many generations (Kitchener et al., in preparation). They have not reverted morphologically or genetically to become like their ancestor, the western polecat, *M. putorius*.

5. Diversification of the domesticated species into a variety of forms which might merit subspecific or even specific status through artificial selection of traits or rare mutant alleles does not invalidate the initial domestication event as a form of speciation.

6. Therefore, in its strictest definition, domestication of a wild species has results similar to allopatric speciation. It follows, therefore, that domesticated forms should be recognised as taxa distinct from their ancestors.

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(7) W.F.H. Ansell

Trenrine, Zennor, St Ives, Cornwall TR26 3BW, U.K.

I am in complete agreement with the proposal to conserve the usage of the 15 mammal specific names based on wild species. I adopted this procedure in two of the parts of *The mammals of Africa*, using the names *Bos primigenius* for the aurochs and *Equus africanus* for the wild ass.

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(8) Augusto Azzaroli

Museo di Geologia e Paleontologia, Università di Firenze, Via G. La Pira, 4–50121 Firenze, Italy

I write to express my approval of the proposals made by Gentry et al. on mammalian nomenclature.

Until now I have used the names *Equus caballus* and *E. asinus* but I confess that the application has convinced me to change my attitude. I regret that I did not see the proposals until my last article on American equids was already published. I also have a paper in press on horses from the Forest Bed Formation and do not know if I will be in time to change the nomenclature. I shall be more careful in future.

(9) R.J. Berry

Department of Biology, University College London, Darwin Building, Gower Street, London WC1E 6BT, U.K.

I write to support the proposal by Gentry et al. to rationalise and stabilise the specific names of mammals which have domesticated forms. This has become important with the increase in conservation legislation (CITES, and such). The case made by the authors seems wholly sensible, and formalises the practice of most workers.

(10) L.M. Gosling
Institute of Zoology, The Zoological Society of London, Regent's Park,
London NW1 4RY, U.K.

I write as Director of Science of the Zoological Society to express my strong support for the conservation of the 15 mammal specific names detailed in the application. It is particularly important to distinguish clearly between wild animals and their domestic counterparts to avoid any confusion in species conservation programmes.

(11) Simon Tonge
London Zoo, Regent's Park, London NW1 4RY, U.K.

I write as Senior Curator. I support the proposition to conserve the usage of 15 mammal specific names on the grounds that stability in the nomenclature of these mammals should override strict priority.

Stocks of wild animals in zoological gardens are increasingly part of managed in situ conservation programmes. Staff managing these programmes are not necessarily nomenclatural specialists and changes of name cause confusion and uncertainty.

In the 1995 edition of the *Mammal Inventory of the Federation of Zoological Gardens of Great Britain and Ireland* the nomenclature follows Wilson & Reeder (1993) except in the instances of the African wild ass, *Equus africanus*, and Przewalski's wild horse, *E. przewalskii* (sometimes treated as a synonym of *E. ferus*). A decision was made that to follow these authors in their use of *Equus asinus* and *E. caballus* would (a) cause confusion amongst holders of the species, and (b) distract attention from the conservation importance of these taxa which are, respectively, critically endangered and extinct in the wild.

(12) S.K. Eltringham
Department of Zoology, University of Cambridge, Downing Street,
Cambridge CB2 3EJ, U.K.

I have read the application by Gentry et al. with great interest and consider the proposal to conserve the specific names of wild animals which are distinct from the domestic forms derived from them to be eminently sensible. It would lead to greater stability in nomenclature and reduce confusion, particularly in the conservation of rare breeds of domestic animals whose wild progenitors have lately been given the same scientific name. I very much hope that the Commission will accept the recommendations of the authors.

(13) C.S. Churcher
RR 1, Site 42, Box 12, Gabriola Island, British Columbia V0R 1X0, Canada

I am writing in support of the application by Gentry et al.

I have worked with archaeological, palaeontological and neontological taxa and have found the confusion in usage of the names of some mammalian taxa, as set forth in the proposal, and the formats that are applied to many taxa that are domestic, domesticated or commensal, to be a source of argument and dispute. I find these contentions an unnecessary waste of time and energy and support any move towards simplifying or regularising the situation. Thus I am in full agreement with the proposal in Case 3010.

I retired from the Department of Zoology, University of Toronto, last July and have moved to British Columbia. Thus, I am a professional working as a mammalogist in archaeozoology, mammalogy and palaeontology and consider myself reasonably au fait with the situation and with the intentions of the proposers. I should like to see the proposal adopted.

(14) David L. Harrison & Paul J.J. Bates
Harrison Zoological Museum, Bowerwood House, St Botolph's Road, Sevenoaks,
Kent TN13 3AQ, U.K.

We are writing to express our strong support for the application.

We believe that the conservation of the 15 mammal specific names is advisable for the following reasons:

(a) Interests of stability. These existing specific names have been in current use for many years.

(b) Ambiguity concerning the biological origin of certain domestic species. The cat, goat, sheep and cattle, for example, may have more than one ancestral species.

(c) Nomenclature. The wild species are better defined, often with type material and precise type localities, and related taxa are better compared in these circumstances.

For these reasons we wish to support the application very strongly.

(15) N. Spassov
National Museum of Natural History, Bulgarian Academy of Sciences,
Blvd. Tzar Osvoboditel 1, Sofia 1000, Bulgaria

I should like to express my full agreement for the argument and proposal of Gentry et al. to conserve the 15 specific names for mammals based on wild species.

With regard to the wild Holocene European horse, the name *Equus ferus* should be conserved only for the species described by Boddaert (1785) and later by Antonius (1912). This is the horse from the Russian steppes (the tarpan), whose fossils we have found recently, demonstrating its wild nature. Current research seems to show that there is another Late Pleistocene horse which has crossed the Pleistocene/Holocene boundary in East Europe.

(16) T.P. O'Connor
Department of Archaeological Sciences, University of Bradford,
West Yorkshire BD7 1DP, U.K.

I write with reference to Case 3010 to urge that the proposed conservation of 15 mammal specific names based on wild species be accepted.

The authors have set out most clearly the difficulties and differences of view that have surrounded the nomenclature of domesticated animals, and it is clear that this debate has some way to run. Wilson & Reeder (1993) have unhelpfully introduced an alternative nomenclature for the wild species, the only merit of which is its rigid adherence to rules of priority, and that only if wild and domestic forms are accepted as conspecific in all cases. As the specific status of domesticated forms is still not the subject of a consensus view, it makes little sense to use Linnaeus's (1758, 1766) names for domesticated forms to refer to individuals in wild populations. The fact that CITES and other legislative organisations have adopted the first available name based on wild species is also important. It would be irresponsible to compromise the protection of endangered species simply in order to follow a rather questionable interpretation of the rules of priority.

(17) Arturo Morales Muñíz

Laboratorio de Arqueozoología, Departamento de Biología, Universidad Autónoma de Madrid, E-28049 Madrid, Spain

Ever since I joined the archaeozoological community, back in 1976, a dispute on how to name domestic animals has been going on around me. Although the tempo of the debate slowed down during the past decade, in the first half of the present one it has gone up again (see the list of references in the application).

In the early years I was not at all concerned with the issue, which struck me as an empty, formal discussion devoid of any practical value. Over the years, however, my views on this problem have gradually changed, so that at present I appreciate the issue in a completely different way. Thus, for example, to stress one line of argument, I fully subscribe to Gentry et al.'s claim that 'The use for wild species of names that were first described on domestic species ... will confuse ... customs officials who have the job of sorting out illegal imports of endangered species'. This is no trivial issue for many of the surviving progenitors of domestic animals (the bezoar, the Bactrian camel, and others) are in serious danger of extinction, and customs officials '... would find it difficult to impound a trophy head of a wild sheep if it carries the name *Ovis aries*'.

It should be stated that I feel any solution to the problem will be a compromise. The ultimate reason lies in the virtual impossibility of 'straightjacketing' all domestic forms and their ancestors into a formal system of nomenclature. Among other things such systems:

(a) Cannot adequately reflect the whole range of genetic events, including repetitive episodes of backcrossing, raciation and hybridisation which characterise the configuration of domestic stocks to this day (see Gautier, 1990; Wing, 1993).

(b) Have been used by very many authors (even by the same author) in rather inconsistent ways depending on the species involved, the amount of knowledge concerning particular wild species, the philosophy behind their proposals, etc.

Due to these operative and historical factors every attempt to either (i) devise a nomenclatural system for domestic animals independent of that of the wild species (no matter how logical or consistent), or (ii) fully integrate domestic animals and make them conform to the Linnean system, has ended in either rejection or oblivion or both (Bolken, 1958; Dennler de la Tour, 1959; Groves, 1971; Odening, 1979; Corbet & Clutton-Brock, 1984; Gautier, 1993; and Uerpmann, 1993, as set out in paras. 3–5 of the application).

The eventual compromise must be guided, above all, by practicalities. One of the best ways of being practical in this case is to have the names for wild species intermingling as little as possible with those of domestic forms. (For many species, the rabbit for example, this is impossible because the wild and domestic forms share the same name). From this standpoint, I judge Gentry et al.'s application, which requests the Commission to rule that the names for each of the listed 15 wild species of mammals are not invalid by virtue of being antedated by a name based on a domestic form, to fully conform to the compromise. If only for this reason, therefore, I should like to support their proposal.

In science, as elsewhere, formal issues are extremely important but often dwell in the realm of ideas. In addition to its formal connotations, however, I feel that not only are there sound practical arguments in Gentry et al.'s proposal to the Commission, but also that most of these are of far-reaching consequences as well — a matter of deep concern to all of us.

(18) P.A. Jewell

Department of Zoology, University of Cambridge, Downing Street,
Cambridge CB2 3EJ, U.K.

I have been dismayed to see that in *Mammal species of the world*, edited by Wilson & Reeder (1993), they have not adopted the specific names that are in common usage for perissodactyls and artiodactyls. Instead, names based on domestic animals have been introduced. I can find no justification for this action.

I have been involved over many years with the problem of how best to assign Latin names to domestic forms and the confusion in that field has gradually been reduced, even if not finally resolved. To use the nomenclature referred to above is a retrograde step. Current practice is sensible in that most authoritative works have adopted the first available name based on the wild species and not an earlier name (often proposed by Linnaeus, 1758, 1766) that was originally proposed on a domestic form.

I would most strongly urge the Commission to conserve the 15 specific names of mammals that are set out in the application by Gentry et al.

(19) Support for the application has also been received from Prof John Skinner (*Mammal Research Institute, University of Pretoria, Pretoria 0002, South Africa*), Prof Louis Chaix (*Département d'archéozoologie, Muséum d'histoire naturelle, Route de Malagnou 1, Case Postale 6434, CH-1211, Genève 6, Switzerland*), Dr Elizabeth Iregren (*Department of Historical Osteology, Institute of Archaeology, Lund University, Sandgatan 1, S-223 50 Lund, Sweden*), Dr Peter Andrews (*Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.*) and Miss Paulina D. Jenkins (*Department of Zoology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.*).